

REMARKS

Misnumbered claims 29 to 34 were renumbered by the Examiner as claims 39 to 44. The abstract of the disclosure was objected to because of informalities. The title of invention was objected to because of informalities. The specification was objected to because of informalities. Claims 27, 33, 35 and 38 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite. Claims 21 to 39 were rejected under 35 U.S.C. 102(b) as being anticipated by Schwaiger (DE 3625590). Claims 40, 41 and 44 were rejected under 35 U.S.C. 103(a) as being unpatentable over Schwaiger in view of Sternberg (U.S. Patent 4,513,701). Claims 42 and 43 were rejected under 35 U.S.C. 103(a) as being unpatentable over Schwaiger in view of Griffin et al. (U.S. Patent 6,009,843).

Claims 21, 27, 31 and 35 have been amended. Support is found for example in the specification at paragraphs [0018], [0020] to [0022], [0026] and [0028] and in Figs. 1 to 3.

Reconsideration of the present application based on the following remarks is respectfully requested.

Misnumbered Claims

Misnumbered claims 29 to 34 were renumbered by the Examiner as claims 39 to 44. Applicants' thank the Examiner for noticing this typographical error and refer to claims 39 to 44 as renumbered by the Examiner.

Objection to the Abstract

The abstract of the disclosure was objected to for failing to "discuss the method of manufacturing steps of the claims and not just the apparatus." The abstract has been amended to include a method for manufacturing a lightweight valve. Thus, withdrawal of the objection to the abstract is respectfully requested.

Objection to the Title of the Invention

The title of the invention was objected to as not being descriptive. The title has been amended as suggested by the Examiner. Applicants' thank the Examiner for the suggestion. Accordingly, withdrawal of the objection to the title is respectfully requested.

Objection to the Specification

The specification was objected for failing to provide proper antecedent bases for claims 40, 41 and 44. The specification has been amended to add new paragraph [0034.1]. No new matter is added. Support is found in original claims 18 and 20. Accordingly, withdrawal of the objection to the specification is respectfully requested.

Rejections under 35 U.S.C. 112, Second Paragraph

Claims 27, 33, 35 and 38 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite.

Claim 27 was rejected for failing to provide antecedent basis for “the stop” and because the language “a surface extending at right angles or in a direction at right angles to a longitudinal central axis of the valve stem” of claim 27 is allegedly unclear. Claim 27 has been amended to clarify that “the stop” is the “axial stop” recited in claim 25, from which claim 27 depends, and to clarify that “the axial stop has a surface extending in a plane that is perpendicular to a longitudinal central axis of the valve stem” as now recited in claim 27. Support is found for example in paragraph [0020] and in Fig. 1.

Claims 33 was rejected to because is unclear what is meant by “the bearing surface is fully circular.” Claim 33 has been canceled without prejudice.

Claims 35 was rejected to because is unclear what is meant by “the recess is fully circular.” Claim 35 has been amended to recite “the recess is formed as an annular groove.” Support is found for example in paragraph [0028] and in Fig. 3.

Claim 38 was rejected to for including the relative term “essentially.” Claim 38 has been amended to remove “essentially.”

Claims 27, 35 and 38 are submitted as being clear and definitely and thus withdrawal of the rejections under 35 U.S.C. 112, second paragraph, is respectfully requested.

Rejections under 35 U.S.C. 102(b)

Claims 21 to 39 were rejected under 35 U.S.C. 102(b) as being anticipated by Schwaiger (DE 3625590).

Schwaiger discloses several embodiment of engine valves that are shown graphically in Figs. 1 to 7.

Claim 21

Claim 21, as amended, recites “[a] method for manufacturing a lightweight valve with a valve stem, a hollow valve cone and a valve disk closing the valve cone, the method comprising:

producing a first one-piece component forming the valve disk with the force transmission element by casting, forming and/or a powder metallurgy method;

producing a second one-piece component forming the valve stem and the valve cone, the second one-piece component having an inner wall defining a hollow space within the valve stem and the valve cone; and

joining the first and second components together by placing the force transmission element into the hollow space, bringing the inner wall and force transmission element into contact and connecting the first and second components by at least one of a material, non-positive and positive connection.”

It is respectfully submitted that Schwaiger does not disclose “producing a second one-piece component forming the valve stem and the valve cone” as recited in claim 21. The Examiner alleges that this limitation is taught by Fig. 2 of Schwaiger. It is respectfully submitted that it is clear from Fig. 2 of Schwaiger that the valve cone and valve stem in Schwaiger are formed as two distinct components and not as a “one-piece component” as now recited in claim 21.

Furthermore, it is respectfully submitted that Schwaiger does not disclose “joining the first and second components together by placing the force transmission element into the hollow space, bringing the inner wall and force transmission element into contact and connecting the first and second components by at least one of a material, non-positive and positive connection” as now recited in claim 21. Neither Fig. 2 nor the disclosure of Schwaiger in any way indicates that a first one-piece component and a second one-piece component are joined by placing a force transmission element of the first one-piece component into the hollow space of the second one-piece component. It is respectfully submitted that it is unclear how the Examiner is relying on the

figures of Schwaiger to anticipate a method claim because the figures, nor the disclosure of Schwaiger, indicate how the parts of the valve of Schwaiger are formed and joined together.

Based on the foregoing, withdrawal of the rejection under 35 U.S.C. 102(b) of claim 21 and its dependent claims is respectfully requested.

Claim 31

Claims 31, as amended, recites “[a] method for manufacturing a lightweight valve with a valve stem, a hollow valve cone and a valve disk closing the valve cone, the valve stem being provided with a hollow space at an end facing the valve disk, the valve disk also having a force transmission element extending through the hollow valve cone into the stem hollow space, the method comprising:

producing a first one-piece component forming the valve disk with the force transmission element by casting, forming and/or a powder metallurgy method;

producing a second component forming the valve stem and the valve cone; and

joining the first and second components together and connecting the first and second components by at least one of a material, non-positive and positive connection;

wherein the force transmission element has a bearing surface extending in a direction of a longitudinal central axis of the force transmission element and bears flat against a correspondingly designed countersurface of the stem hollow space after the first and second components are joined together, the bearing surface and the countersurface both having a conical shape.”

It is respectfully submitted that Schwaiger does not disclose “the force transmission element has a bearing surface extending in a direction of a longitudinal central axis of the force transmission element and bears flat against a correspondingly designed countersurface of the stem hollow space after the first and second components are joined together, the bearing surface and the countersurface both having a conical shape” as recited in claim 31. It is unclear what portions of the valve shown in Fig. 2 of Schwaiger the Examiner alleges are the “bearing surface” and the “countersurface” of claim 31; however, regardless, it is clear from Fig. 2 that Schwaiger does not disclose “the bearing surface and the countersurface both having a conical shape” as now recited in claim 31.

Based on the foregoing, withdrawal of the rejection under 35 U.S.C. 102(b) of claim 31 and its dependent claims is respectfully requested.

Rejections under 35 U.S.C. 103(a)

Claims 40, 41 and 44 were rejected under 35 U.S.C. 103(a) as being unpatentable over Schwaiger as applied to claim 21 in view of Sternberg (U.S. Patent 4,513,701). Claims 42 and 43 were rejected under 35 U.S.C. 103(a) as being unpatentable over Schwaiger as applied to claim 21 in view of Griffin et al. (U.S. Patent 6,009,843).

Claims 40 to 44 are dependent on claim 21. Sternberg and Griffin were cited solely for that additional limitations of claims 40 to 44 and thus cannot cure the deficiencies in Schwaiger identified above with respect to claim 21. Withdrawal of the rejections under 35 U.S.C. 103(a) is therefore respectfully requested.

New Claim

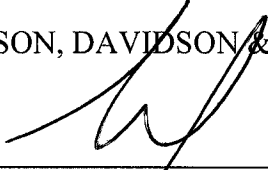
New dependent claim 45 has been added and is allowable for at least the same reasons as independent claim 21, from which claim 45 depends. Support is found in the specification for example at paragraph [0018].

CONCLUSION

The present application is respectfully submitted as being in condition for allowance and applicants respectfully request such action.

Respectfully submitted,

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